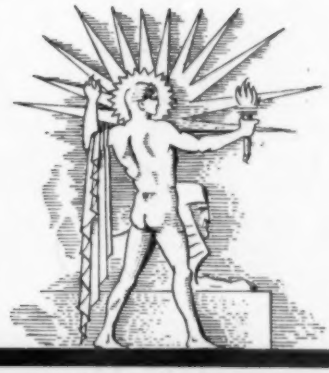
# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 7, 1938

Flowing Rocks

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A SCIENCE SERVICE PUBLICATION

# *Do You Know?*

Oranges in their skins are hard to buy in southern China, because merchants sell the peelings separately for use in Chinese medicine.

A real white elephant is an albino beast with yellowish pink eyes, but some so-called white elephants are merely pale-colored common elephants.

One Texas doctor has provided himself with a trailer hospital, and he is using it at the rate of once a day at rural homes for obstetrical cases alone.

Government surveyors are checking boundaries of Indian reservations in western New York state, where original lines and corner markers have been obscured by time.

All doors should open outward, rather than in, for safety if a quick exit is ever needed, and screen doors should open outward for the added reason that flies find it harder to enter.

Efforts on a nation-wide, semi-official scale are being made to get the Japanese people to eat unpolished rice as a health measure, since polishing removes the anti-beriberi vitamin B.

Ten years ago, the United States was producing annually almost 100 million bushels of durum wheat—used in macaroni and similar foods—but in the past five years the crop has fallen to around 17 million bushels a year, due to rust, drought, and shift to bread wheats.

## QUESTIONS DISCUSSED IN THIS ISSUE

*Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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**PUBLIC HEALTH**

What former cause of child mortality has been much abated? p. 306.

Two new pigments have been isolated from fresh ripe fruits in Hungary.

To make circus life safer for an African gorilla, its cage is being airconditioned to resemble the climate of the Belgian Congo.

By measuring the force of gravity at different latitudes, Russian scientists are attempting to find out how much the globe is flattened at the poles.

Whaleoil lamps are believed to have served Boston Light, the first lighthouse built in this country.

The first-born child in a family is apt to be shorter and lighter in weight at birth than later-born children.

Acetate rayon takes different dyes from other textiles, thus adding to the range of color combinations that can be produced in materials.


# SCIENCE NEWS LETTER

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GENERAL SCIENCE

# Ether Drift Experiment Is Repeated With Success

## Failure 40 Years Ago Started Einstein Studies; Positive Results Now Obtained With Canal Rays

THE ETHER drift experiment, whose failure more than forty years ago started Einstein on the investigations that led to the relativity theory, has at last been repeated in modified form with successful results, which were reported before the meeting of the National Academy of Sciences by Dr. Herbert E. Ives of the Bell Telephone Laboratories.

The secret of Dr. Ives' success was his use of streams of positively charged particles or ions, known as canal rays, instead of the beams of light originally tried in the classic Michelson-Morley experiment in 1887. This experiment undertook to find out to what extent light would be deflected from its straight path through the ether when it was made to take a course at right angles to the direction of the earth's motion through space. Light treated in this way might be considered scientifically as a clock, and the expectation was that a clock in motion should run slower than one at rest.

### Slowing Down is Slight

So slight is the slowing-down that no speeds available to experimenters when the theory was announced were adequate for a crucial test. But by using as a "clock" the light-giving oscillation of a hydrogen ion, which can be shot down a vacuum tube at a thousand miles a second, it is possible to measure a definite change in the color of the light. That, of course, means a change in the rate of vibration of the atom.

Why the experiment is epochal is seen from the history of science. As the wave theory of light gained acceptance, people asked, "Is this 'ether,' which carries the waves, stationary in space, or is it dragged along with the observer?" The crucial experiment was rather simple—measure the velocity of light in the direction of motion of the earth and at right angles to it. Michelson and Morley tried it first, in 1887, and other experimenters repeated it with great refinement of technique. All the conclusions were that the ether appeared to move with the earth.

Did, then, each heavenly body drag along its own ether? This was hard to believe. Eventually, about the turn of the century, three scientists, Fitzgerald, Larmor and Lorentz, developed a theory according to which light could appear to have the same velocity across and with a stationary ether. This could occur, they found, if a clock would slow down and a rod would grow shorter when in motion by amounts related in a certain way to the velocity through the ether.

In 1907 Stark discovered that hydrogen ions, which emit light whose color tells their vibrating frequency, and so can be used as "clocks," could be brought up to sufficiently high speeds in a vacuum tube, to serve as means to test this theory. Because of experimental difficulties the experiment has been classed for thirty years as "hypothetical." Recently, due to experiments in the type of vacuum tube needed made by Dr. A. J. Dempster of the University of Chicago, actual performance of the experiment has become feasible.

Dr. Ives' apparatus uses a vacuum tube in which there is a small amount of hydrogen. An electric arc breaks down the hydrogen molecules into charged ions. These are picked up by a high-voltage electric field and brought up to the speeds of the order of a thousand miles a second. Looking into the end of the tube, the observer sees these ions approaching him, and by means of a mirror he also sees them apparently receding from him. If his eyes were sufficiently sensitive to color, he would notice that the receding ones were redder than the approaching ones. This is called the Doppler effect. But as compared with the color of stationary ions, those moving in either direction are redder. That is, they vibrate more slowly. And that is what Fitzgerald, Larmor and Lorentz proposed nearly forty years ago —atomic "clocks" oscillating more slowly as they move through a stationary medium called the ether.

### Radium Cancer

Radium poisoning tragedies, that have created sensations in the news recently, have been paralleled in experiments on rats, as a means toward better understanding of the human cases and their more effectual prevention. The researches, conducted at the Massachusetts

*NEW EVIDENCE ON OLD QUESTION*

***Dr. Herbert E. Ives, physicist of the Bell Telephone Laboratories, working with the apparatus with which he repeated the famous ether-drift experiment, this time successfully because he used canal rays instead of light beams.***

Institute of Technology, were described by Drs. Robley D. Evans and Robert S. Harris.

The two scientists fed young rats three different amounts of radium chloride in daily doses of 20, 35, and 70 millionths of a gram, respectively. The rats got rid of most of this by excretion—at the highest dosage levels 98 to 99 per cent. of it. Yet the small amount remaining proved fatal.

Their growth appeared normal, yet after a short time the bones became very fragile, so that they would break when the rats were picked up and handled in the ordinary manner. After fifteen months they developed osteogenic sarcoma (bone cancer) that closely resembled the bone ailment in radium paint workers who had been exposed for from ten to fifteen years.

Rats seem to be much more resistant to radium poisoning than human beings. Dr. Evans stated that the average concentration of the element in their skeletons was several hundred times greater than the concentration required to produce osteogenic sarcoma in man.

### New Chlorophyll

Something new under the sun, a definitely new kind of green coloring matter (chlorophyll) in plants, was presented for the consideration of the Academy by Prof. O. L. Inman of Antioch College and Dr. A. F. Blakeslee of the Carnegie Institution of Washington.

The new chlorophyll was obtained by manipulating one particular chromosome, the heredity-controlling structure within the cell, in a plant of the jimsonweed family. It resulted in the production of a strain of offspring with a different combination of the "a" and "b" chlorophyll components than that of all other known plants. It is the first case of its kind on record.

### Medals Awarded

A British biologist and an American electrical engineer were honored with the presentation of two gold medals at the meeting.

The Agassiz Medal for Oceanography was awarded to Dr. Edgar Johnson Allen, director emeritus of the Plymouth Laboratory of the Marine Biological Association of the United Kingdom. Dr. Allen is noted for his researches on marine organisms, and he has also done much to encourage scientific work by others.

Dr. Allen was unable to be present in person to receive the medal, and in his absence it was handed to Leander McCormick-Goodheart of the British Embassy for transmission through diplomatic channels. Dr. E. G. Conklin of Princeton University, president of Science Service, made the speech of presentation.

The Academy's Public Welfare Medal was presented to Dr. Willis Rodney Whitney of the General Research Company research laboratories. The presentation address was made by Dr. Albert W. Hull, a colleague of Dr. Whitney.

Dr. Whitney's outstanding researches in the field of electrical engineering have been on electric lighting and in the use of high-frequency currents in the treatment of arthritis, paresis, and other diseases. He began the organization of General Electric's research laboratories in 1900, as a part-time diversion from his position as a professor at the Massachusetts Institute of Technology, and has seen their development to an institution with a full-time staff of 300 scientists.

*Science News Letter, May 7, 1938*

GEOPHYSICS

# "Late" Artillery Reports Give Clues to Stratosphere

## Minute Slow in Arriving, Sound Travelled Very High And Was Reflected From Warmer Stratospheric Layer

REPORTS of naval guns, arriving at distant sensitive instruments later than they should according to theory, give meteorologists clues to the temperatures high in the stratosphere, Dr. Beno Gutenberg, California Institute of Technology geophysicist, reported to the American Geophysical Union, meeting in Washington, D. C.

Using a special air-pressure-change instrument, resembling a radio loudspeaker, designed by Dr. H. Benioff, Dr. Gutenberg detected variations in air pressure that coincided with naval gunfire offshore.

Sound from the gunfire arrived at the sensitive instruments almost a minute later than it theoretically should have, indicating that it traveled into the stratosphere and was reflected from a layer of warm air high above the earth's surface. From time and distance studies, Dr. Gutenberg, assisted by the U. S. Navy, determined that sound in Southern California travels at the same speed as in Europe, suggesting similar upper-air conditions.

### Hot Rock Destroys

Evidence that geological records of the earth's oldest happenings have been destroyed by molten rock masses rising to the surface of the earth in later times was reported by Dr. E. N. Goddard of the U. S. Geological Survey.

Starting more than 50,000,000 years ago during the eocene age when primitive mammals were displacing the great dinosaurs, a mass of molten rock rose up from the depths to break the billion-year-old crust of the earth at a point where today the mining camp of Jimtown, Colo., is located, Dr. Goddard declared.

In the intruded rock, he found fragments of these older rocks, some of them hardly changed by their submersion in the molten mass. Other fragments were greatly changed, and there is evidence that still others had been melted and dissolved in the rising mass, transformed into part of it.

These findings, Dr. Goddard pointed out, show on a small scale the cycle of rock changes that is going on everywhere. Molten rocks are washed away, deposited as sediments, then they are heated and squeezed into new forms, then are absorbed by intruding melted rocks, beginning the cycle all over again.

### Roots of Volcanoes

Volcanoes' roots may go down to a molten earth-interior after all, despite the disrepute into which that theory, once universally held, has fallen during recent years. A picture of the roots of volcanoes, presenting the old theory in more acceptable modern form, was offered by Prof. Reginald A. Daly of Harvard University.

Prof. Daly likened the crust of the earth to a wrinkled layer of solid paraffin floating on an interior of melted paraffin. The actual materials of the earth's crust and deeper layers are, of course, stony. Solid stone floats on the molten stone. Connecting masses be-

***ACADEMICIANS***

***At the spring meetings of the National Academy of Sciences—Dr. Ross G. Harrison, chairman, National Research Council and trustee of Science Service (above). Entering the lobby (above, center) are Dr. Frank R. Lillie, president of the Academy, and Dr. John C. Merriam, of the Carnegie Institution of Washington.***

***PETITIONERS***

***Discussing a petition to President Roosevelt on the Spanish situation are (lower center) Dr. Harlow Shapley, Harvard College Observatory, Dr. Harold C. Urey, Columbia University, and Dr. F. R. Moulton, permanent secretary, AAAS. Listening intently (above) are Dr. R. A. Millikan, California Institute of Technology and Dr. Gano Dunn, of New York City.***

tween the volcanoes and the molten interior Dr. Daly called by a new name, "abyssoliths," meaning bottomless stone. An abyssolith carries to the surface molten rock material, with steam and other gases under great pressure. These gases are the real explosives that supply motive power to volcanoes, he said. When the abyssolith's supply of them is spent the volcano "goes out."

The molten interior of the earth is of course not to be thought of as a liquid sloshing around like water in a jug. If it were at the surface, it might be liquid; the material is hot enough so that at least some of it would flow freely. But buried at great depths as it is, the molten interior mass is under such terrific pressure that it is held to a steely rigidity. In terms of the surface the interior can be stated only as a paradox: molten, yet stiff.

### Electrical Rivers

Vast electrical rivers several hundred miles wide flow through the thin atmosphere between 60 and 90 miles above the earth in the polar regions, Dr. A. G. McNish of the Carnegie Institution of Washington stated. He has recently conducted a study of these currents by means of a new method of mathematical analysis.

The currents flow westward along the auroral zone, a belt about 1,500 miles from the North and South Poles. They appear during magnetic storms and are attributed to the action of particles projected through space from the sun. These particles also give rise to the auroral displays. During the most intense magnetic storms the auroral zone shifts to lower latitudes and the currents flow in more southerly regions.

This accounts for the interruption of radio and wired communications during several severe magnetic storms that occurred last year, Dr. McNish explained.

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PHYSICS

## Cosmic Rays Operate Radioteletypewriter

COSMIC rays and ultra short radio waves were combined to operate a radioteletypewriter in a novel exhibit in Rochester, N. Y.

Speeding across interstellar space from the most distant galaxy, the cosmic rays register their passage on a Geiger-Mueller counter, which in turn operates a relay to supply an initiating impulse to operate a radiotype. The radiotype machine receives news bulletins distributed by one of the major news services. The exhibit is sponsored by the International Business Machines Corporation, one of whose electric typewriters is included in the radiotype circuit.

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GENERAL SCIENCE

## Harrison, Murphy, Riegel Science Service Trustees

THREE new trustees of Science Service, the institution for the popularization of science, were elected at its annual meetings in Washington.

Dr. Ross G. Harrison, chairman of the National Research Council, will become one of the representatives of that organization on Science Service's governing body. Dr. Harrison is director of the Osborn Zoological Laboratory at Yale University.

O. W. Riegel, director of the Lee School of Journalism at Washington and Lee University, was named one of the trustees representing the newspaper profession. J. Edwin Murphy, managing editor of the Baltimore Evening Sun, is the third new trustee. He also represents journalism.

Science Service, established by the late E. W. Scripps, newspaper publisher and philanthropist, to bring before the public authoritative accounts of the achievements of science, is governed by a board of trustees containing 15 members, representing scientific organizations, the Scripps estate and the newspaper world.

Dr. Robert Andrews Millikan, California Institute of Technology Nobel

Prize winner, was reelected as a trustee to succeed himself as a representative of the National Academy of Sciences on Science Service's board. Dr. Henry B. Ward of the University of Illinois was likewise re-elected a trustee. He represents the American Association for the Advancement of Science.

Science Service's other trustees include Dr. Harlow Shapley, Harvard College Observatory; Dr. W. H. Howell, Johns Hopkins University; Dr. E. G. Conklin, Princeton University; Dr. J. McKeen Cattell, editor of Science; Dr. C. G. Abbot, Smithsonian Institution; Dr. H. E. Howe, editor of Industrial and Engineering Chemistry; Dr. Warren S. Thompson, Scripps Foundation for Research in Population Problems; H. L. Smithton, E. W. Scripps Estate, and Dr. John H. Finley, editor of the New York Times. The position on the board occupied by the late Robert Paine Scripps is being left vacant this year.

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GENERAL SCIENCE

# Scientists' Plea Is Move To Save World From Fascism

MUCH deeper significance than aid to Spanish democracy is behind a letter which 18 of America's scientists have sent to President Roosevelt.

Vital concern about the inroads that fascism and dictatorship are making upon freedom in science and other fields motivated the plea to the President that he lift the Spanish arms embargo.

These leading scientists feel that by giving support to democracy in other lands, they are acting to preserve in America "that democratic tradition which has allowed science to advance." They believe that continuance of the embargo against the Spanish government jeopardizes the peace of the United States "by encouraging fascist nations to proceed with their use of war as an instrument of national policy."

If the military power of Italian and German invaders engulfs Spain, then France as one of the few surviving democracies will be endangered. So they fear. Therefore, they feel that giving the Spanish republic an opportunity to defend itself is "a great service both for science and for democracy."

Scientists in the aggregate have not often been articulate about such questions. In the past, even during world wars, scientific work has been relatively unhampered by political affairs. Today in fascist countries it is very different.

A trio that includes two Nobel prize winners and a leading astronomer formulated the letter which was then signed by 15 other scientists, all members of the National Academy of Sciences.

Dr. Harold C. Urey, Nobelist and professor of chemistry at Columbia University, Dr. Arthur H. Compton, Nobelist and professor of physics at the University of Chicago, and Dr. Harlow Shapley, director of the Harvard Observatory, worked together in framing the letter to the President.

Others who signed the letter were:

Dr. Roger Adams, University of Illinois chemist; Dr. J. McKeen Cattell, psychologist and editor of *Science,* New York; Dr. Arthur B. Coble, University of Illinois mathematician; Dr. Edwin G. Conklin, Princeton biologist; Dr. Charles A. Kraus, Brown University chemist; Dr. S. Lefschetz, Princeton University mathematician; Dr. S. A. Mitchell, University of Virginia astronomer; Dr. F. R. Moulton, astronomer and permanent secretary of the American Association for the Advancement of Science; Dr. Robert S. Mulliken, University of Chicago physicist; Dr. George Howard Parker, Harvard zoologist; Dr. F. K. Richtmyer, physicist, and Dean, Cornell University's Graduate School; Dr. J. F. Ritt, Columbia University mathematician; Dr. Edmund W. Sinnott, Columbia University botanist; Dr. Oswald Veblen, professor of mathematics, Institute for Advanced Study, Princeton; Dr. Sewall Wright, University of Chicago zoologist.

Dr. Walter B. Cannon, the Harvard physiologist, has been active in raising medical aid for the Spanish republican cause. In England, Dr. J. B. S. Haldane, the biologist, has worked for the Spanish loyalists and makes numerous trips to Spain in this connection. Prof. A. V. Hill, British physiologist and Nobelist, is also outspoken against fascism. The leading British scientific journal, *Nature,* has repeatedly published articles and letters critical of the fate of science and scientists in the dictator countries. On several occasions it has come under Nazi bans.

*Science News Letter, May 7, 1938*

MEDICINE

## Thyroid Hormone in Ear Improves Hearing of Some

THE MIRACLE of making the deaf hear has been at least partially wrought by injections into the ear of thyroxine, hormone secreted by the thyroid gland. Results of this method of treatment were reported by Dr. Max A. Goldstein of St. Louis, Mo., at the meeting of the American Laryngological, Rhinological and Otological Society.

The patients, 35 of them, were suffering from the chronic hereditary type of deafness known as otosclerosis. In this condition spongy bone forms in the capsule of the labyrinth of the ear. Dr. Goldstein injected the thyroxine into the middle ear.

Careful tests of the hearing were made with the audiometer before and after the treatment. Improvement in hearing after treatment ranged from 35 per cent. to 50 per cent. In other words, while not cured completely of deafness, these patients recovered from one-third to one-half of their hearing.

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BACTERIOLOGY

## New Virus Causing Pus Discovered in Rats

SOMETHING new in viruses is a virus that causes abscesses and pus formation in tissues under the skin. These conditions have hitherto been attributed to bacteria alone. A pus-forming, abscess-causing virus has nevertheless been discovered in rats. The discovery, made in the course of cancer investigations, is reported by Drs. William H. Woglom and Joel Warren of the Institute of Cancer Research and College of Physicians and Surgeons, Columbia University. (*Science,* April 22).

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PHYSICS—CHEMISTRY

## Durand, Kraus, Honored With Franklin Medal

DR. WILLIAM F. Durand, professor emeritus of mechanical engineering at Stanford University, and Prof. Charles A. Kraus of Brown University will receive the Franklin Medal of the Franklin Institute for distinguished work in physical science.

The medals will be awarded May 20 as part of the dedication exercises for the Institute's heroic statue of Benjamin Franklin.

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PSYCHOLOGY

# Propaganda Cannot Cause War; Minds Must be Ready

## Peoples Will Not Fight Unless Social Situation Has Already Caused Them to Develop Fighting Mood

PROPAGANDA cannot bring on a war, Dr. Gregory Zilboorg, New York physician specializing in mental disease, told the meeting of the American Academy of Political and Social Science.

War propaganda can have no effect in rousing the people to war unless social conditions have already put them in a fighting mood, he said:

Conditions which allow expression to man's natural hatred and resentment are not those which put a people in the mood for war, the psychiatrist declared. Instead we must blame those social conditions that suppress the civilized ways of giving vent to indignation.

"In times of peace we have a multitude of civilized ways of expressing our hatred in political campaigns, in violent sports, in vicarious participation in crimes and in that form of public revenge which is known as criminal justice," Dr. Zilboorg said.

"In times of war there are no civilized ways of hating—we must become primitive and we do.

"The more regimented and uniform the state, the more thorough the subjugation of the individual citizen, the more a people is driven into unwelcome passivity, the fewer normal outlets for hatred, the greater the reservoir of hatred stored up within the nation which at certain points is ready to explode.

"An explosion directed against one's own government is revolution, directed against a neighbor it is war.

"This is the reason why dictatorial countries of today are so militarized, so aggressive, so bellicose. They must fight within or without, for they hate and fear either their government or their neighbors.

"Since hatred is easily displaced from one object to another, since we either curse our friend or 'let it out on the dog,' we find the constant shifting, constant displacements of this brewing hatred in the dictatorial states.

"They are called 'purges,' squelching counter-revolutions, espionage plots, Jews, foreign enemies.

"Aggressive though these countries appear to democratic communities, their people as well as their governments are sincerely convinced that they do nothing more than defend themselves . . . These are real and not imaginary emotions which give cohesion and strength to the masses."

For this reason also free and democratic countries seem relatively peaceful.

"If citizens can dethrone a king and see him into exile because they don't like the woman he loves," Dr. Zilboorg explained, "if they may call him a quitter, they will feel that a great amount of aggression and hatred has been 'let out,' lived out, done with.

"In a country where a president may be and is called names, where there are occasional riots and frequent social battles, where men can strike and picket and curse and accuse and make peace and settlements and fight again — in such a country there is so great a variety of outlets for hatred, aggression, socialized defeats and victories, that the nation as a whole must feel more pacific than belligerent towards the rest of the world.

"It is psychologically impossible in such countries to succeed with war propaganda.

"War propaganda," Dr. Zilboorg concluded, "is somehow hopelessly inefficient when people have enough to eat and when they are not afraid and when they are permitted to be socially angry.

"On the other hand, war propaganda becomes extremely effective even in the true democracies, if events 'strike home,' if there is little to eat, if a Lusitania is sunk, when fear and hatred come as natural reactions to an increasing sense of insecurity."

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The European starling, introduced in New York's Central Park in 1890, is migrating westward and many are now seen in Wyoming.

*JAWBONE OF A WHALE*

***If Samson could have had a jawbone like this when he conducted his little mopping-up party against the Philistines it would have served his purpose even better than the one he did use. But this whale lived long before Samson: something like 34 million years, geologists estimate. This interesting fossil is now preserved in the museum of the Catholic University of America (See SNL, April 23, p. 275.)***

PHYSIOLOGY

## Dog Breeding Damages Behavior Governing Glands

DOG fanciers, striving for perfection of established standards in body and head shapes in the various kinds of dogs, pay for them in part by making poor mothers out of the females they breed, Prof. Charles R. Stockard of Cornell University indicated in a report to the American Philosophical Society.

Glands are responsible for the abnormal behavior, Prof. Stockard declared. In breeding for the artificially established "points" that win pure-bred dogs their bench prizes, the fanciers also unintentionally establish internal abnormalities, including some that affect the behavior, especially maternal behavior.

Bulldog females, for example, have abnormal eating tendencies immediately after birth, that in some cases result in the devouring of their own new-born puppies. Big dogs with abnormally large heads, like St. Bernards and mastiffs, lack the reflexes that other bitches have, of pushing their puppies out of the way as they lie down, so that they often crush them to death. Still other breeds lose their attachment for their owners and become runaways and wanderers before their puppies are born.

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ENGINEERING

## British Fingerprint Roads in Skid Study

USING some of the fingerprint tricks of Scotland Yard, the Department of Scientific and Industrial Research of Great Britain is now studying slippery roads by taking fingerprints of motor car tires.

As reported in *Industrial and Engineering Chemistry,* published by the American Chemical Society in Washington, D. C., the road under study is coated with an ink and a perfectly smooth tire rolled over it. The tire is then transferred to white paper and an exact record of the texture of road surface, over which the tire has rolled, is obtained.

Slippery roads have been found to be those in which there is a high ratio between the total area of contact between tire and road and the number of isolated points of contact. The latter, isolated areas, must be surrounded by channels deep enough so that the water on the road can escape as the tire passes over.

If the channels are too small the individual areas merge and the surface behaves like a smooth one. The requirements for non-skid tires are similar.

On very slippery roads studies show that the tire makes contact with the pavement over nearly all its surface of contact while the number of individual contacts is small. Good roads, low in skid values, were found to be those yielding prints that disclosed a lesser area of total contact and many more individual points of contact. A "sandpaper" surfaced road, with its many tiny and almost imperceptible points of irregularly, is typical of a highway low in slipping characteristics. Not only are different road surfaces being studied, but tests are also underway to study the skidding characteristics of the same roads at different times of the year.

*Science News Letter, May 7, 1938*

PSYCHIATRY

## Psychiatric Institute Starts "Fatigue Service"

A "FATIGUE service" for industrial employees has been established at the Neuro-Psychiatric Institute of the Hartford Retreat, Dr. C. Charles Burlingame, psychiatrist-in-chief of the institute, announced in his annual report.

The object of the newly organized service is to increase the efficiency and happiness of the individual worker by helping to solve emotional or personality problems which may threaten not only his efficiency but his mental health.

"These emotional difficulties are quite as incapacitating to the employee as a physical illness," Dr. Burlingame said, "and often more annoying to the industrial organization.

"Chronic fatigue, irritability, inability to get along with fellow-workers, feelings of persecution, a chronic state of 'being agin the government,' crying for no good reason at all on the job or at home may be outward evidence of a condition which may so affect the efficiency of the worker that much of his value to himself and to his employer is destroyed.

"More progressive employers are beginning to realize the dollars and cents value of finding an answer. This interest is not of the welfare variety which implies a patronizing supplying of uplift facilities, recreational benefits, etc., but rather, an intelligent effort to get at the root of the individual mental disorders, just as industry is going at the problem of the employees' physical health."

*Science News Letter, May 7, 1938*

# IN SCIENC

PHYSIOLOGY

## Brain's Heat Center Shown By Electrical Warming

THE BRAIN has a definite "heat center that responds to heating by speeding up breathing, starting perspiration, and initiating other physiological means for cooling off the body. Its existence and location have been demonstrated by Dr. H. W. Magoun of Northwestern University Medical School.

In his experiments, Dr. Magoun applied electrical warmth to various parts of the brain of an anesthetized cat. When respiration speeded up, and the toe-pads showed signs of sweating, that was taken as an indication of stimulation of the heat center.

This region that responds to rise in temperature lies on the underside of the front part of the brain, and partly on the underside of the midbrain. Normally, Dr. Magoun supposes, this heat center receives its stimulus from increased temperature of the blood. Heated environment warms the body, which in turn warms the blood, and when circulation carries it to the brain its increased temperature triggers the cooling-off reactions of sweating and faster breathing.

*Science News Letter, May 7, 1938*

GEOLOGY

## Glaciers of Rock Flow Slowly Down Mountain Side

**See Front Cover**

CREEPING sluggishly but almost irresistably down the slopes of Snowmass Mountains, in the West Elk Mountains of Colorado, from the cirques once occupied by ordinary ice glaciers, these sheets of rock, here photographed from the air for the United States Geological Survey, gradually obliterate the ordinary glacial features of the mountain flanks, replacing them with barren flats of loose and broken rock. Rock glaciers were first noted in Alaska, and have since been found in many parts of the world. The longest one shown in this picture, the central rock glacier, is about two miles long.

*Science News Letter, May 7, 1938*

# NCE FIELDS

ANTHROPOLOGY

## Indian Skulls Show Great Range in Brain Size

SOME Indians that lived in recent times had brains smaller than that of ancient *Pithecanthropus erectus,* the ape-man of Java; other "modern" Indians had brains bigger than those of present-day geniuses among white men.

Skulls measured to show these striking contrasts were shown to the meeting of the National Academy of Sciences by Dr. Ales Hrdlicka of the U. S. National Museum. The smallest skulls were those of Peruvian Indians, the biggest two were from Alaska and near Washington, D. C., respectively.

The Peruvian skulls had capacities as low as 910 cubic centimeters; compared with this is the Pithecanthropus cranium's estimated 1,000 cubic centimeters. The biggest skull (the Potomac Indian) has a volume of 2,100 cubic centimeters; most of the noted scientists who looked at it have brains only about three-quarters that large.

*Science News Letter, May 7, 1938*

AERONAUTICS

## Commander Rosendahl Pleads For U. S. Airships

CALLING for construction of four Zeppelin type airships, two for commercial and two for naval purposes, Commander Charles E. Rosendahl, United States Navy, outlines a program for revival of the airship in the United States in a new book, "What About the Airship?"

New types of ships and one rigid and several non-rigid ships in addition should be built and tried by the U. S. Navy, he urges. The "Los Angeles," lighter-than-air craft built in Germany for the United States following the World War, should be recommissioned, he declares, if found suitable after careful examination.

Comdr. Rosendahl, who once skippered the *Los Angeles,* is noted as America's outstanding authority on airships. He is commander of the Lakehurst Naval Air Station, most important airship base in the United States, and was on duty at the time of the *Hindenburg* disaster a year ago.

"The greatest stumbling block in the path of the airship is lack of understanding," he asserts in his defense of the airship. "America won't give up the airship, I am sure. But when are we going to do something serious about it?" he asks.

Finding the Zeppelin type of ship of potentially great use as a scout and as a high-speed plane carrier for national defense, he also believes it commercially justified for long distance non-stop flights at intermediate speeds. He quotes operation figures recorded by the ill-fated *Hindenburg* in its first year of operation as proof that a transoceanic airship line operating on a frequent schedule can be made to pay. The *Hindenburg's* passenger and freight revenue covered 75 per cent. of the cost of operating, including terminal expenses and other overhead that would not be materially increased by more airships.

*Science News Letter, May 7, 1938*

ENGINEERING

## Goodyear Zeppelin Testing Aluminum Airship Girders

ENGINEERS of the Goodyear Zeppelin Corporation, builders of the Akron and Macon and probable builders of the proposed replacement for the Los Angeles, have been conducting tests to determine the resistance to fatigue of various types of aluminum alloy airship girders, states a report prepared by them for the National Advisory Committee on Aeronautics, government aeronautical research organization.

Alternate compressions and tensions at a rapid rate of change were applied to test girders by means of an ingenious resonance fatigue machine. Failures were found to occur most frequently at crescent-shaped holes, while solid girders were the most resistant to fatigue.

The tests have been under way for at least several months, certainly before it became known that construction of an airship was contemplated in the naval expansion bill. The Goodyear Zeppelin Corporation has been carrying on lighter-than-air craft experiments during past years despite the relative lack of interest in the United States in airships.

Such research as the fatigue tests reported are especially necessary in the airship field, it is pointed out, because too few ships are built to enable satisfactory data to be gathered from past experience.

*Science News Letter, May 7, 1938*

PHYSIOLOGY

## Thyroid and Pituitary Blamed for Mongolism

MONGOLOID deficiency was blamed on the thyroid gland by two different investigators who reported their separate research at the meeting of the American Association on Mental Deficiency in Richmond, Va. The term mongoloid is used to describe this condition because the mental defect, present at birth, is accompanied by a mongoloid appearance.

Overactivity of the thyroid gland of the mother may account in part for the birth of a child with this mental defect, Dr. C. Roger Myers of the University of Toronto suggested. His theory is based on comparison of all records on 215 non-mongoloid mental defectives with 215 mongoloid mental defectives.

Both thyroid and pituitary glands—the one the large U-shaped gland in the neck and the other the important gland at the base of the brain—were blamed for the condition by Dr. Clemens E. Benda of Wrentham, Mass., State School and Harvard Medical School.

Mental growth among inmates of an institution for mental defectives is greatest before the age of 14, but it may occur after 14 years and to a lesser extent after 16 years, Edith Wladkowsky, psychologist at the Caswell Training School, Kinston, N. C., found on retesting three groups of individuals after an interval of from two to six years.

*Science News Letter, May 7, 1938*

MEDICINE

## Spinal Anesthetic Treatment For "Super" Blood Pressure

A LIFE-SAVING emergency treatment for patients with "super" high blood pressure who are in danger of fatal brain hemorrhage was reported by Dr. Albert S. Hyman of New York City to the American College of Physicians.

The treatment consists of removing a small amount of fluid from the spinal canal and injecting into this canal an anesthetic solution. This treatment reduces the high blood pressure and carries the patient through the emergency period. Dr. Hyman stressed that the treatment is only an emergency method of giving temporary relief, but added that in some cases the blood pressure had remained at the lowered level for relatively long periods of time following the treatment.

*Science News Letter, May 7, 1938*

CHEMISTRY

# New Fiber Made From Soybean Protein To be Used in Autos

## Ford Factories Already Have Half-a-Dozen Good Jobs For Chinese Legume's Products; Good Mixer With Tung Oil

A NEW synthetic fiber, made from the protein material of soybeans, was exhibited for the first time by Dr. R. A. Boyer of the research department of the Ford Motor Company before the meetings of the Fourth Annual Conference of the Farm Chemurgic Council, at Omaha.

The new fiber, destined for use in automobile upholstery, was developed as an outgrowth of work by Italian chemists in making a synthetic wool from milk casein. This Italian work, first announced two years ago, inspired American chemists to do similar things with soybeans. The new fiber will not stand washing and so, at present, may not be useful as clothing, but for upholstery it appears suitable.

### New Extraction Plant

So successful has been the application of soybean oil and soybean meal in motor cars, said Dr. Boyer, that the Ford Company is soon to open a new soybean oil extraction plant at Salina, Mich.

Here are the ways soybeans enter into automobile manufacture as outlined by the Ford Company scientists:

1. The enamel on Ford cars contains 35 per cent. soybean oil and 300,000 gallons of this oil were needed in 1937.

2. The foundry uses some 250,000 gallons yearly in its operations.

3. Soybean meal, from which the oil has been extracted, is widely used in the plastic molding compounds from which are made steering wheels and other parts of motor cars. Last year 400,000 pounds of soybean meal were used in this way.

4. Soybean meal is also being used in the foundry of the steel mill, where large-sized cores in the molds are made of this material. A million pounds of this core binder, containing a large proportion of soybean meal, was used by the Ford plants last year.

5. Soybean meal finds additional use as an impregnating agent for gaskets.

6. A water-soluble paint, using soybean oil as the carrying agent for paint pigment, has been developed and is being employed in the Ford factories. While tests are still under way, a plant producing this paint is contemplated which would utilize 500,000 pounds of soybeans a year for its oil requirements.

### Soy and Tung Blend

Two vegetable oils, from soy beans and tung nuts, have been blended and processed to make a new American-produced liquid for use in paints.

Future commercial use of the new soy-tung oil was predicted by Matt F. Taggart, of the O'Brien Varnish Company, South Bend, Ind., who told of 100,000-gallon tests in comparison with linseed oil paints.

Heating the oil mixture quickly to 850 degrees Fahrenheit is claimed to give it drying properties which will allow it to compete with linseed oil, most of which is produced abroad. Soy bean and tung oil are now being produced in this country.

### Should Grow Drug Plants

American agriculture, seeking new crops to grow, might well consider the production of plants which form the basis of crude drugs and which are now imported to the amount of over $8,000,000 a year, Dr. Perrin H. Long of the Johns Hopkins University, told the conference.

Crude licorice from Russia, licorice extract from Spain, ma huang (ephedrine) from China, castor beans from Brazil and tragacanth from Persia; all these are among the important crude drug imports which might be grown in the United States, so far as climate and soil are concerned.

Licorice grows as a weed in the Southwest, said Dr. Long, and may have definite commercial possibilities.

Ma huang—ephedrine—is being cultivated in North Dakota at the present time, he pointed out. Whether it will be commercially successful remains to be determined, but the attempt is a noteworthy one of trying to free the United States from foreign factors which influence the importation of this important medical drug.

Current conflicts and past disasters have worried the importers of crude drugs. After the 1923 Japanese earthquakes the price of crude menthol doubled. Our supply of ephedrine has been seriously menaced since last August by the Sino-Japanese troubles.

Main disadvantage of American growers of drug plants is that if they use the hand cultivation methods, handed down from the past, and used in foreign countries, the costs of the plant drugs are too high, said Dr. Long. What needs to be done is to have science and industry cooperate and develop machines which can do the cultivation and harvesting job cheaply.

*Science News Letter, May 7, 1938*

METALLURGY

## Static Electricity Used To Separate Ores

EVERY small boy who has ever rubbed a piece of sealing wax with cat's fur and attracted to it bits of paper knows that in the forces of static electricity lies one means of separating materials. Small boys, grown up to become mining engineers, long ago realized that somehow static electricity might be used commercially to separate valuable from worthless ores.

The idea is old, of course, but it never has been applied widely and successfully to large scale separation of ores as have the magnetic separation and various flotation methods. The trouble in those early days was that the sources of electricity—the old-fashioned Wimshurst machines and so on—were ineffective. Later the use of transformers and mechanical rectifiers of current arrived and some improvement came also. But, as H. B. Johnson reports to the American Institute of Mining and Metallurgical Engineers, there has been little development in the last ten years despite great advances in the radio and vacuum tube art in that decade.

Mr. Johnson has studied the electrostatic separation of over 90 different elements with a simple and ingenious apparatus. The mineral mixture to be separated feeds down a hopper on to the surface of a rotating cylinder charged electrically positive. Nearby this cylinder is another one charged with electricity of the opposite sign by using a full-wave high-voltage rectifying tube. The voltage created sets up a strong electric field that pulls the falling particles out of line in their vertical fall and makes them drop

on the other side of a suitable vertical dividing sheet of material. Thus one component of the mixture falls on the one side and the unattracted particles on the other.

Mineral granules the size obtained in commercial grinding machines were used in the tests. One difficult separation achieved was the removal of bituminous coal dust from anthracite dust. Among the difficult separations made possible were those of separating (1) galena from pyrite, (2) muscovite from lepidolite (both micas) and (3) calcite from dolomite.

*Science News Letter, May 7, 1938*

CHEMISTRY

## Two New Vitamins $L_1$ and $L_2$ From Liver, Yeast

TWO new vitamins have just been added to this rapidly growing family of food essentials. The names $L_1$ and $L_2$ have been selected for these latest vitamins by their discoverers, Drs. Waro Nakahara, Fumito Inukai and Saburo Ugami of the Institute of Physical and Chemical Research, Tokyo. Reporting their discovery (*Science,* April 22), the Japanese scientists state that both L vitamins are needed by rats to produce milk for their young. Baker's yeast is the source of $L_2$ but not of $L_1$, which comes from beef liver.

*Science News Letter, May 7, 1938*

CHEMISTRY

## Sixth Part of Vitamin B Obtained in Crystal Form

ISOLATION of chemically pure crystals of vitamin $B_6$ has been reported by Dr. Paul Gyorgy of Western Reserve University School of Medicine (*Jr. American Chemical Society,* April). This part of the vitamin B complex cures a skin disease in young rats which occurs when the animals eat a diet lacking in vitamin $B_6$.

*Science News Letter, May 7, 1938*

## ●RADIO

***May 12, 3:00 p. m., E.S.T.***

**RARE METALS FIND USES—Paul M. Tyler of the U. S. Bureau of Mines.**

***May 19, 3:30 p. m., E.S.T.***

**LOST ARTS OF THE STONE AGE—Dr. H. C. Shetrone, Director of the Ohio State Museum.**

**In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.**

*OLD WAS DIRTY; NEW IS CLEAN*

***The silver-painted building nestled close to the large old frame coal breaker is the new coal refining building. Inside and out it gives the appearance of an oil refinery. Clean enough to allow workmen to wear white clothes, it will certainly better working conditions in the coal fields.***

MINING

# High-Grade Fuel Made From Run-of-the-Mine Coal

SUCCESSFUL development of a process for the cheap production of standardized high-grade fuel from virtually any grade of material ranging from run-of-the-mine coal down to refuse has been announced.

A pilot plant for production of high-grade coal from low-grade materials is in operation at Shenandoah, Pa. Discoverers of the process, developed in research work begun in 1902, and operators of the pilot plant are the E. I. du Pont de Nemours and Company.

Made possible by the use of recently available heavy liquid compounds, the process depends on the fact that materials with different weights for the same volume can be separated by placing them in a heavy liquid the specific gravity of which is between the materials to be separated. The heavier material sinks to the bottom, the lighter one floats on top.

Halogenated hydrocarbons, such as pentachlorethane and tetrabromethane, the latter three times as heavy as water, are the chemicals whose specific gravities are between those of coal and slate. Slate is the refuse from which second-grade and even poorer coal must be separated in order to produce a commercially usable product.

The coal-and-slate mixture which is run through this liquid which separates coal from slate, the latter sinking to the bottom, is pretreated with an active agent solution which places a water film around the particles of coal and slate. This latter step constitutes the achievement which has rendered the process commercially feasible.

The heavy liquids used in the process do not change in specific gravity while in use so that the quality of the coal produced in any breaker or cleaning plant is not dependent on the human element. The heavy liquids can be recovered and used again, making the process cheap to operate.

Production of an improved and standardized coal through use of the new method is anticipated by the engineers who developed the process.

The sink-and-float process, as it has

*SINK OR FLOAT*

***The essence of the new coal refining process is shown here. Dr. E. F. von Wettberg picks the pure coal from the top of the bowl which is filled with a liquid of a density between that of the slate and the coal. The slate remains on the bottom.***

been named, is expected to replace mechanical sorting means now used by coal mine operators to separate some of the coal from second grade material containing slate.

The "jigs" used at present for this purpose, are relatively inefficient, leaving considerable coal on the refuse pile. The process is important economically partly because of the fact that pure veins of coal, particularly anthracite, are inadequate to meet the demand.

*Science News Letter, May 7, 1938*

PSYCHOLOGY

## Babies Imitate Without Any Need for Teaching

WHEN baby first says "Da-Da" after his proud father, it is not because he has been taught to imitate, Dr. Wayne Dennis, of Clark University, declares. In an experiment reported by Dr. Dennis, twin babies were brought up with no rewards for imitation and no attempt on the part of adults to imitate the babies. The baby naturally repeats his own actions or imitates himself, and he imitates the adult at the very first opportunity, Dr. Dennis said. The twins very seldom imitated each other, however.

*Science News Letter, May 7, 1938*

ASTRONOMY

# New Kind of Star Group Discovered at Harvard

### Egg-Shaped Mass Undiscovered Until Present Because Light From its Thousands of Stars is Extremely Faint

A GIGANTIC star-cluster, unlike any known class of cosmic systems, possibly a member of a whole family of such star clusters previously unsuspected in the universe, has been discovered by Harvard astronomers.

The egg-shaped group is located in the southern constellation Sculptor. Because its light is extremely faint, only the most powerful telescopes can detect the individual star members. This unusual faintness probably explains why the cluster has been hidden from man until now. Otherwise, its tremendous size, including thousands of stars and extending over a range of two degrees in the heavens, would easily have revealed its existence.

Discovery of the group as described by Dr. Harlow Shapley, director of the Harvard Observatory, was largely a matter of good luck, for only the fact that an unusually sensitive photographic plate happened to be exposed on Sculptor on a very clear night, revealed its existence. The exposure was made at Harvard's South African observation station at Bloemfontein.

#### Resembles Three Types

Many characteristics of the new cluster are similar to those of three entirely different types of stellar systems, the globular star clusters, the Magellanic clouds and the spheroidal galaxies. The Sculptor group differs markedly from each of these on many points, however, and thus may be representative of a heretofore unknown class somewhere between these three.

Able to count the thousands of stars now visible in the cluster with relative ease, astronomers have not yet been successful in measuring its distance or size, characteristics essential for proper classification of the object. Astronomers are now photographically combing the cluster for variable stars whose flickerings can be used as astronomical yardsticks in determining these distances.

Except for a small elongation in the east-west direction, the cluster appears roughly globe-shaped, and its individual stars can be seen and counted easily on the best photographs. They are arranged fairly compactly at the center of the group with the space between each star increasing fairly regularly toward the cluster's rim.

The very brightest stars in the system are only about the eighteenth magnitude, extremely faint, inasmuch as the naked eye can detect stars only up to about the sixth magnitude. In general the brighter stars seem to be bunched more closely in the center, although there is no nucleus to the cluster or any outstanding nuclear stars. Off-center clusters, cloud-like formations or other irregularities which would spoil the system's marked uniformity are also absent.

#### Little Total Illumination

About 10,000 stars are in the group with magnitudes between 18 and 19.5 according to preliminary estimates. Astronomers have no idea how many fainter stars it may contain. Despite this tremendous number of stars, the cluster yields surprisingly little total illumination and Harvard astronomers are of the opinion that some unusual physical characteristics of the stars, or of the group, cause this low brightness. This conjecture substantiates the suspician that the cluster may be typical of a large family of such objects scattered throughout the universe whose low luminosity has heretofore concealed them.

At first astronomers tentatively interpreted the faintness of the cluster as indicating they had found a super-galaxy, an unusually far-off system of thousands of island universes, each of them similar to and about the size of our own Milky Way, but later photographs showed that the cluster's separate bodies are not individual groups of millions of stars but individual stars.

Most probable of the conjectures offered concerning the nature of the cluster, in the light of evidence so far uncovered, Dr. Shapley said, is the theory that the stars may have an absolute

magnitude of minus 1.5, about that of the brightest stars in the globular star clusters. Proof of this, of course, must await the discovery of variable stars in the group, but if the assumption is correct, the cluster is about 250,000 light-years away and has a diameter of about 6500 light-years.

*Science News Letter, May 7, 1938*

PHYSIOLOGY

## New Sex Hormones Aid in Studies of Gland Ailments

TWO newly-discovered male hormones found in women of the "bearded lady" type were described by Dr. Fred C. Koch of the University of Chicago at the New York Academy of Medicine.

Chemically these two new male hormones are related to one of the female hormones and to the cortical hormone of the adrenal glands. This suggests, Dr. Koch pointed out, that women become "bearded ladies" because of disorders in either adrenal glands or ovaries which lead to production of the new male hormones.

Total number of known male hormones is now seven, Dr. Koch reported. Chemical studies of these hormones may lead in future to tests which will show whether too much or too little of any or all of them are being produced in the body. This would enable physicians to detect various glandular disorders at an early stage without resorting to exploratory operations.

The adult of the human species is unique, Dr. Koch pointed out, in that both males and females excrete from 20 to 100 times the weight of male hormones per liter as stallion, bull, ram or male rats. The total weight of male hormones excreted by men and women in the United States is estimated at between one-half and one ton per day.

*Science News Letter, May 7, 1938*

A bee laden with honey cannot sting, even in self-defense.

ARCHAEOLOGY

## 1,045 Dishes in Tomb Believed New Record

ONE thousand forty-five vases—archaeologists counted them — were found when a French expedition dug its way into a tomb in Syria.

Explorers are accustomed to find a pottery bowl or two in primitive or ancient graves. Placing offerings of food and drink with the dead is a widespread custom that began far back in prehistoric times, and that has seemed reasonable even to some well advanced civilizations. Occasionally a burial is found containing a large assortment of dishes. But over a thousand of them, intact—well, that is believed to constitute a record. It would stock a sizable shop.

Explaining why so much pottery was showered on a tomb containing two individuals is a problem for archaeological reasoning. A British archaeologist, M. E. L. Mallowan, suggests this answer:

He thinks the two buried there may have been so venerated that for generations people continued to bring offerings.

Other clues besides pottery point to this theory. There were large quantities of goat bones in the tomb, which may have been remnants of ritual feasting. The tomb was supplied with an entrance like a well shaft, down which offerings and the goat bones could be lowered.

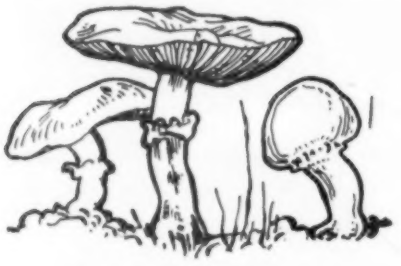
This Syrian tomb is at least as old as the eighteenth century before Christ. Mr. Mallowan regards it as older, possibly as early as 2500 B. C.

*Science News Letter, May 7, 1938*

BOTANY

# NATURE RAMBLINGS

*by Frank Thone*



## A Pallid Brotherhood

FUNGI are a pallid brotherhood. Not theirs the gleaming green that is for plants the equivalent of the red glow of health in higher animals. They have no chlorophyll, they cannot make their own foods. So they must do as we and the animals do, and eat foods already made.

Some fungi are parasites, feeding on the still-living bodies of plants and animals. Most, however, are not hawks but vultures, devouring the dead. There is a special name for this mode of living on dead things, a companion-word for parasitism. Such plants are called saprophytes. Freely translated from the Greek, the word means decay-plants. Saprophytes are not to be thought of as plants that live on dead and decaying things; they themselves cause the decay by their feeding.

The visible parts of fungi, that attract our attention, are of many forms and colors. Mushrooms are most familiar, perhaps, and their relatives the puffballs, the shelf or bracket fungi that grow on trees, the odd attractive little earth-stars, and the odder but decidedly less attractive stinkhorns. A little more distantly related, but still kin to the mushrooms, are the coral-fungi, the tooth-fungi, the living jellies called tremellas, and the curious form known as Jew's-ear.

A different group, less frequently seen than the mushrooms and their relatives but very interesting in their varied forms, are the cup-fungi. You will sometimes find their bright red-orange cups on dead sticks in damp woods. Another member of this group is the morel, looking like a mushroom that tried to turn into a sponge; odd-appearing, but very good to eat. There are many bad parasitic species among the cup-fungi, among them ergot, a powerful drug.

The two foregoing great groups account for most of the larger fungi, but there is a great variety of forms that in mass look like thin webs of cottony threads or even thick pads of felt. These include molds, mildews, etc. In this section of the fungus group also are perhaps the great majority of the parasites —rusts, smuts, wilt fungi, etc., as well as fungi that cause diseases of animals. Some of these fungi cause death of insects by countless millions.

The activities of all these pale, hungry plants sound like unrestrained destruction. To some extent it is. Plant diseases are very costly, and vast spoilage of foods, fabrics, and wood is caused by molds. But the decay of dead bodies of plants and animals is a necessary thing, lest they cumber the earth, and this scavenger work by innumerable fungi must be counted one of the great beneficial activities of plants.

*Science News Letter, May 7, 1938*

PUBLIC HEALTH

# Health Army Has War Maps For Disease Fight

MOST newspaper readers are familiar with the pin- or flag-marked war maps that show the advancing or retreating lines of conflict and other important information on which battle plans are laid. Some of you have doubtless kept such maps of your own for handy reference when following war news.

Did you know that the great army of health experts which fights to protect us from disease has similar war maps? They hang on the walls of every health department (or should) to give information as to the whereabouts of the enemy and his strength. They are charts showing daily, weekly, monthly and yearly reports of cases of communicable diseases.

The battle lines, marked usually by colored pins, show the advance or retreat of various disease enemies. These lines are called curves. Sometimes, as during epidemics, they are sharply pointed, advancing rapidly to a high peak and usually falling down more slowly to the normal or expected level of cases for that particular disease. The continuous downward sweep of other curves shows the triumph of medical and health science over a particular disease.

Looking over the curve of monthly mortality rate from all causes of death combined, for all ages, Metropolitan Life Insurance Company statisticians find that the enemy has been driven back on one important sector. This consists of the summer months when the death rate formerly ran high chiefly because of "the slaughter of young children by intestinal diseases." Improved sanitary conditions and purer milk and water supplies are the big guns that have broken down the enemy lines on this sector.

The health armies are concentrating now on driving back the enemy lines in the cold season of the year. This means hard fighting against pneumonia, colds, influenza and also on the chronic diseases of heart and kidneys of old people.

*Science News Letter, May 7, 1938*

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It is estimated that 10 per cent of people in this country suffer from some kind of allergy, that is, are hyper-sensitive to some food or other substance.

PSYCHOLOGY

# Opinions on Social Matters Go With Brand of Politics

## Republicans Tend Toward Conservative Views; Democrats Are Liberals; Both Agree in Nationalistic Attitudes

DEMOCRATS and Republicans may be diametrically opposed in some matters, but they agree on others, Dr. Ross Stagner of the University of Akron found from a survey reported to the Midwestern Psychological Association meeting in Madison, Wis.

When 50 men and 50 women indicated like or dislike for certain terms such as "Democrat" or "Republican" and also their opinions on problems of social and political importance, it was revealed that particular brands of politics are related to certain opinions. Republicans are likely to hold anti-labor opinions and be opposed to unemployment insurance, for example, while Democrats tend in the opposite direction. Yet both are likely to agree on opinions of nationalist sentiment, Dr. Stagner found.

### Counting Seconds Doesn't Help

Wait a minute!

If you really did pause for what you estimated to be a minute, you probably counted or tapped to aid you in judging the lapse of time. About 90 per cent. of persons tested do, Drs. A. R. Gilliland and R. F. Martin, of Northwestern University reported.

But the counting does not help much. When, in a second experiment, the investigators asked the subjects to refrain from such aids, they got along without them. They were not significantly less accurate, however. The main difference was that they shifted from overestimation in the first experiment to underestimation in the second. In general they missed by about 40 per cent. of the true time interval and missed just as badly on longer intervals as they did on brief 15-second spans.

### Want Only to "Get By"

Children failing to do well in school aim at goals far above their past achievements, while the bright ones aim far below what they have achieved previously, Dr. Harold H. Anderson of the University of Illinois and Dr. H. F. Brandt of Drake University reported.

Contrary to general opinion, the level of aspiration is related to the level of achievement, these investigators found from a study of fifth-grade children. But the level of aspiration tended consistently toward mediocrity.

### Relaxation Not Complete

Sleep is not always accompanied by complete relaxation, Dr. Edmund Jacobson, of the Laboratory for Clinical Physiology, Chicago, told psychologists at the meeting.

Although the moment of falling asleep may be marked by sudden or by more or less prolonged progressive relaxation in the muscles of arms and legs, muscular tension in the lips or jaw muscles may continue as shown by marked action currents from these muscles, Dr. Jacobson reported.

This finding has an important bearing on psychologists' theories of the nature of sleep.

### Alike During Sleep

Do men lose their personality during sleep?

That question was raised by the report of Drs. John R. Knott, Charles E. Henry and John M. Hadley, of the University of Iowa, that the distinctive brain waves, said to mark the go-getter type of person from the self-centered, quiet sort, lose their distinguishing qualities when both persons are asleep. In sleep the brain waves of the two types of persons are remarkably similar, they found.

### Tension Greater

Muscular tension in the arms and neck of a person doing mental work increases as the work becomes more difficult, Dr. R. C. Davis, of Indiana University, told the meeting, in reporting an interpretation of 6,000 measurements of the electrical potentials which accompany muscle tension.

Arm muscles show less activity than the neck muscles when the person is resting, but they have much greater increase of tension when the individual is at work, Dr. Davis found. Failure to find the correct solution to problems did not seem to cause any significant difference in the action currents.

The idea that girls popular with the boys are not liked by their own sex was exploded by a survey reported by Dr. J. E. Janney, of Western College, Oxford, Ohio.

Women with a large number of girl friends have more dates with the boys than do the girls who are less popular with their own sex. They are also superior in college grades, intelligence, and athletic achievements. They have more feminine admirers and also think more of other women.

*Science News Letter, May 7, 1938*

PSYCHOLOGY

## Civilization Threatened Unless Intellect Rules

MAN will soon utterly destroy civilization unless he can succeed in enthroning reason to rule his acquisitive passions, Dr. Foster Kennedy, physician of the University of Toronto, warned in an address before the Toronto Club.

If man, as an individual or in nations, merely prostitutes his intellect for purposes of destruction, he will not only destroy civilization but will destroy himself with his own instruments, Dr. Kennedy said.

"We have come lately close to doing it and we are threatened with it now," he declared.

"Indeed, the private lives of each of us, and the hope of the World, lie at the mercy of the dictation, or the digestion, of three men. Let us all say in no uncertain voice, a plague on all your blouses—black, brown, or red . . . "

### Must Master Self

Man, by his intellect, has mastered his environment, but not himself, Dr. Kennedy said. The body and the emotional system have lagged far behind the development of the brain cortex. Evolution demands a new control of man's nature, he believes.

"The evolution of our nervous system ordains that, age after age, a new chieftain is put in command of our nervous hierarchy," he explained. "This chieftain controls, but does not kill all those which have gone before.

"At present we should be under the control of intellect."

*Science News Letter, May 7, 1938*

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A Soviet scientist has written a grammar of the Khorezmian language, which is one of the world's extinct kinds of speech.

# •First Glances at New Books

**Medicine**

ALCOHOL: ONE MAN'S MEAT—Edward A. Strecker and Francis T. Chambers, Jr.—*Macmillan,* 230 p., $2.50. The title and red cover of this book seem to fall short of conveying an adequate impression of its solid qualities. Not that it is difficult to read—far from it. The style is easy and case histories enliven it further. But it is not flashy or sensational. It is a careful, detailed presentation of the psychology of alcoholism as the authors see it, and of their method of treating alcoholism.

*Science News Letter, May 7, 1938*

**Horticulture**

THE GARDEN OF PINKS—L. H. Bailey—*Macmillan,* 142 p., illus., $3. Good botanical descriptions of species cultivated in North America, with clean-cut line illustrations; instructions for cultivation, practical and fully stated; descriptions of the diseases of pinks and means for combating them. An unusually good book for the serious gardener.

*Science News Letter, May 7, 1938*

**Horticulture**

THE GARDENER'S OMNIBUS—E. I. Farrington—*Hale, Cushman and Flint,* 886 p., $3.75. A big, hearty-looking volume—a lot of book for the money. It talks about various types of gardens and what to put in them, of lawns and pools and ornamental trees, the selection and arrangement of cut flowers and a whole lot of other things. A regular one-volume horticultural encyclopedia, except that it's all informal. Lots of pictures, of course.

*Science News Letter, May 7, 1938*

**Horticulture**

ANNUALS FOR YOUR GARDEN—Daniel J. Foley—*Macmillan,* 93 p., col. illus., $1. A little book with bright pictures, and close descriptions of many desirable annual flowers.

*Science News Letter, May 7, 1938*

**Oceanography—Archaeology**

TRANSACTIONS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. XXIX, PART II; ARTICLE II: THE VARIATION IN THE SILICATE CONTENT OF THE WATER IN MONTEREY BAY, CALIFORNIA DURING 1932, 1933 AND 1934—Austin Phelps. ARTICLE III: THE OLD STONE AGE IN EUROPEAN RUSSIA—Eugene A. Golomshtok—*American Philosophical Soc.,* 315 p., illus., $3. Dr. Golomshtok's monograph will be especially useful to American archaeologists and anthropologists, because it systematically summarizes everything known about palaeolithic culture in Russia—materials which have hitherto been both badly scattered in the literature and buried in a language which most Americans cannot read. The publication contains a large number of good plates.

*Science News Letter, May 7, 1938*

**General Science**

PROCEEDINGS OF THE FLORIDA ACADEMY OF SCIENCES FOR 1936, Vol. 1.—*Pub. by the Academy,* 170 p., paper bound, $1. One of the newest of state academies of science here makes its bow, with the published proceedings of its first meeting. A number of the papers are published in full, leading off with "Opportunities for Research in Florida," by Prof. Herman Kurz, the Academy's first president; abstracts of the others complete the volume. The number and variety of subjects argues both the richness of the science field in this Southern state and the ability and will of the workers to explore it.

*Science News Letter, May 7, 1938*

**Climatology**

RAINFALL AND TREE GROWTH IN THE GREAT BASIN—Ernst Antevs—*Carnegie Inst. of Wash. and Amer. Geographical Soc.,* 97 p., $3. A prominent paleoclimatologist, who has done notable research on lake varves and their interpretation, here offers a study on climatic rhythms and changes as recorded in the growth records of trees.

*Science News Letter, May 7, 1938*

**Geography**

YOUR WASHINGTON—Mary Field Parton—*Longmans, Green,* 193 p., $2. A trip to Washington should include visits to some of the many centers of science there. The delightfully informal information in this readable guide will steer you to the high spots.

*Science News Letter, May 7, 1938*

**Engineering**

MASTER BUILDERS OF SIXTY CENTURIES—John Anderson Miller—*Appleton-Century,* 315 p., $3. A popular account of engineering achievements of ancient and modern times. With Boulder Dam and the Golden Gate Bridge so familiar to us in current news, it is enlightening to compare the construction work of Rome, Babylon, medieval cathedral builders, and the men who gave us the Panama Canal.

*Science News Letter, May 7, 1938*

**Geography—Physics**

JOURNEY TO MANAOS—Earl P. Hanson—*Reynal and Hitchcock,* 342 p., $3. The personal narrative of a man who went to one of the world's hard-to-reach places to take measurements of cosmic forces. What befel on the way makes up the book: rough going and smooth, amusements and annoyances, gossip and history, interesting folk among missionaries, businessmen, and natives. And determined slogging toward destination despite a haze of fever. A hard book to put down without finishing.

*Science News Letter, May 7, 1938*

**Engineering**

AUDEL'S NEW AUTOMOBILE GUIDE—Frank D. Graham—*Audel,* 1499 p., $4. Contains both information on the principles underlying the operation of automobiles and practical data of value to mechanic and serviceman.

*Science News Letter, May 7, 1938*

**Metallurgy**

CHEMICAL ANALYSIS OF METALS AND ALLOYS—Edwin Gregory and Walter W. Stevenson—*Chem. Pub. Co. of N. Y.,* 375 p., $6. British text on the use of chemistry in analyzing metals and alloys.

*Science News Letter, May 7, 1938*

**Mathematics**

SPRINKLE'S CONVERSION FORMULAS—Leland W. Sprinkle—*Blakiston's,* 122 p., $1.25. A batch of handy conversion formulas conveniently arranged for the busy person who hasn't the time to remember how many centiliters there are in a hogshead, and the like.

*Science News Letter, May 7, 1938*

**Mathematics**

A COURSE OF PURE MATHEMATICS (7th ed.)—G. H. Hardy—*Macmillan,* 498 p., $3.75. This well known text on mathematics is now entering its 30th year of publication. The present edition revises and brings the book up to date.

*Science News Letter, May 7, 1938*

**Physiology of Vision**

THE SCIENCE OF SEEING—Matthew Luckiesh and Frank K. Moss.—*Van Nostrand,* 548 p., $6. The subject is discussed chiefly from the standpoint of illumination.

*Science News Letter, May 7, 1938*

**Engineering**

DRAINAGE BASIN PROBLEMS AND PROGRAMS, 1937 REVISION—National Resources Committee—*Govt. Print. Off.,* 154 p., maps, 65 c.

*Science News Letter, May 7, 1938*